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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/037,067

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David E. Clune

Clune 3-4-18

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EXAMINER

NEURAUTER, GEORGE C

ART UNIT

PAPER NUMBER

2143

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,067

Applicant(s)

CLUNE ET AL.

Examiner

George C. Neurauter, Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-1 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

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DETAILED ACTION

Claims 1-11 and 13-15 are currently presented and have been examined.

Response to Arguments

Applicant's arguments filed 14 August 2006 have been fully considered but they are not persuasive.

The Applicant argues that Bonomi does not disclose a circularly linked list further comprising a list of destination nodes, each destination node having an associated destination address for receiving multicast data and a link to a next destination node for processing. The Examiner is not persuaded by these remarks.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Bonomi expressly discloses:

"One such feature is the multicast capability. Multicast typically refers to the ability of one end-station (source end station) to send a cell to several end-stations (target end-stations) without the source end-station having to retransmit

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the cell to the individual target end stations. (column 2, lines 45-52)

"The present invention is directed to management of queues in the memory of a cell switch, and more particularly to the support of multicast transmissions. A switch in accordance with the present invention maintains a separate queue for each branch of the multicast connection so that each branch can be served according to the specific service parameters it is set up with. In the case of a multicast connection, several multicast cells are received from a source end-system. Each cell received on the multicast connection is transmitted on several output branches to achieve the multicast function. Transmission on each output branch may correspond, for example, to transmission out of a port of the switch." (column 3, lines 50-62)

"Queue manager 430 determines the ports on which each cell needs to be transmitted. In one embodiment described in further detail below, queue manager 430 maintains a port mask associated with each QID. A table providing the mapping may be stored in scheduler memory 431. The port-mask identifies the output branches (in port card 491) on which the cells of that QID need to be transmitted. As each branch may be associated with a port, the port-mask indicates the specific ports in port-card 491 on which the cells for the corresponding QID need to be

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transmitted. For multicast cells to be transmitted on more than one port of a port card, the port-mask will indicate that transmission is required to more than one port. In one embodiment, only one branch of a physical queue can be transmitted on a port, and a bit is therefore maintained for each branch/port. One value indicates that the cells corresponding to the QID need to be transmitted on a corresponding port, and the other value indicates that the cell should not be transmitted on the port. Cells for each output branch are identified by a logical queue. All the logical queues are based on a single physical queue. The maintenance of physical and logical queues in an example embodiment will be described below." (column 11, lines 26-47)

"As each logical queue is traversed (by scheduler 470) in the cell order, the head-pointer corresponding to that logical queue is updated to reflect the processed cells for that branch. Thus, a head pointer for a logical queue points to the next cell to be processed in the cell order for that logical queue (branch)." (column 13, lines 40-45)

"Port-mask table 530 is used to identify the branches on which each cell in a physical queue is to be transmitted. In one embodiment, each port can have only one branch of a multicast connection associated with it. Accordingly, port-mask table 530

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identifies the ports on which the corresponding cell is yet to be transmitted. Thus, with reference to the queues illustrated in FIG. 5, assuming that branches 1 and 2 are to be transmitted on ports 1 and 2 respectively, port masks 530-A, 530-C and 530-D are shown with a mask of 0001 indicating that corresponding cells 520-A, 520-C and 520-D are to be transmitted on port 1 only (i.e., output branch 1). On the other hand, the port masks 530-H and 530-L have a value of 0011 indicating that the corresponding cells are to be transmitted on ports 1 and 2 respectively." (column 14, lines 3-16)

In view of the disclosures of Bonomi, each destination node or a "storage location" in memory containing a "cell" in a "branch queue" wherein each destination node has an associated destination address or "port mask" which allows the multicast data within the cell to be sent to its targeted end system via a transmission port that is indicated by the port mask. This queue contains links to the next destination node or "head pointer" as also shown above and as shown previously. As also shown previously by the Examiner, Bonomi does not expressly disclose a circularly linked list, however, it would have been obvious to modify the teachings of Bonomi use a circularly linked list as disclosed in Knuth for the reasons disclosed in Knuth and as is well known in the art by those of ordinary skill. Therefore, the

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combined teachings of Bonomi and Knuth reasonably suggest the claimed invention.

For the record, the Examiner emphasizes that the claimed invention employs broad steps which encompass the well known embodiment of traversing a linked list such as a circularly linked list as shown in Knuth and Bonomi and as well known in the art. The claimed steps of forming a linked list, entering the list at an initial node, traversing the nodes by using a link or, as is well known in the art as a "pointer" as also shown in Bonomi, to determine the next destination node to process, and terminating the traversal when all the linked destination nodes have been processed are all well known and used steps for traversing a linked list through the use of pointers as is commonly known in the data structure and computer programming arts. The prior art is replete with numerous intended uses of traversing a linked list and it is emphasized by the Examiner that the nominally recited steps of traversing a linked list which is currently claimed do not place the claims in condition for allowance as shown in view of Bonomi and Knuth and in the broader view of the cited prior art and the level of knowledge of one of ordinary skill in the art regarding linked list traversal.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that

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was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6 219 352 to Bonomi et al in view of "The Art of Computer Programming: 2nd Edition" to Knuth.

Regarding claim 1, Bonomi discloses a method for identifying destination nodes of a multicast session in a network having a plurality of nodes, comprising forming a linked list ("queue") further comprising a list of destination nodes, each destination node having an associated destination address for receiving multicast data ("port mask") and a link to a next destination node in the list for processing ("head pointer"); entering the list at an initial destination node; traversing the linked list to process each destination node, for each destination node, sending the multicast data to the associated destination address and using the link to determine the next destination node for processing; and terminating the traversing step when all linked destination nodes have been processed (terminating at the "tail pointer"). (column 10, line 61-column 11, line 35; column 13, lines 40-column 14, line 16, specifically column 13, lines 46-60 and column 14, lines 3-16)

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Bonomi does not expressly disclose a circularly linked list, however, Knuth does disclose a circularly linked list (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point")

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of these references since Knuth discloses that using a circularly linked list allows for entry into the list at any point (page 270, section 2.2.4 "Circular Lists", specifically "It is then possible to access all of the list starting at any given point"). In view of these specific advantages and that the references are directed to traversing linked lists or queues and entering a linked list at a given point, one of ordinary skill would have been motivated to combine these references and would have considered them to be analogous to one another based on their related fields of endeavor.

Regarding claim 2, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses the method further comprising receiving data intended for transmittal to the identified destination nodes of the multicast session. (Figure 2, step 220; column 7,

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line 54-column 8, line 36, specifically column 7, lines 56-61; column 13, lines 46-48)

Regarding claim 3, Bonomi and Knuth disclose the method of claim 2.

Bonomi discloses wherein the initial destination node is determined from the received data. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47).

Regarding claim 4, Bonomi and Knuth disclose the method of claim 2.

Bonomi discloses wherein at least one destination node of the list, as determined from the received data, is excluded from the multicast session. (column 14, lines 17-25).

Regarding claim 5, Bonomi and Knuth disclose the method of claim 4.

Bonomi discloses wherein the received data includes an indicator identifying the destination node that is to be excluded from the multicast session. (column 14, lines 17-25)

Regarding claim 6, Bonomi and Knuth disclose the method of claim 5.

Bonomi discloses wherein the indicator identifies the destination node from which the data was received as the destination node to be excluded from the multicast session. (column 2, lines 45-67; column 14, lines 17-25).

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Regarding claim 7, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses wherein the initial destination node is predetermined (column 13, lines 40-column 14, line 2, specifically column 13, lines 52-55)

Regarding claim 8, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses the method further comprising receiving data intended for transmittal to the identified destination nodes of the multicast session on an input port, and wherein the initial destination node is determined based on the input port. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47; column 14, lines 47-58)

Regarding claim 9, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses wherein the address for entering the list is the destination node from which the data was received. (column 10, lines 12-60, specifically lines 16-22; column 11, lines 18-47)

Regarding claim 10, Bonomi and Knuth disclose the method of claim 1.

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Bonomi discloses wherein the traversed destination node entries are the identified destination nodes of the multicast session. (column 13, lines 46-60)

Regarding claim 11, Bonomi and Knuth disclose the method of claim 1 wherein destination nodes for a plurality of multicast sessions are interleaved in the list, and wherein the destination nodes for each one of the plurality of multicast sessions are linked. (column 13, lines 18-25)

Bonomi does not expressly disclose a circularly linked list, however, Knuth does disclose this limitation (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point").

Claim 11 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 11.

Regarding claim 13, Bonomi and Knuth disclose the method of claim 1.

Bonomi discloses wherein the link comprises a pointer at each destination node that points to another destination node such that the plurality of destination nodes are linked.

Bonomi does not disclose wherein the destination node entries are circularly linked, however, Knuth does disclose

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wherein entries are circularly linked (page 270, section 2.2.4 "Circular Lists", specifically "A circularly-linked list...has the property that its last node links back to the first...It is then possible to access all of the list starting at any given point").

Claim 13 is rejected since the motivations regarding the obviousness of claim 1 also apply to claim 11.

Claim 14 is rejected since claim 14 recites a method that contains substantially the same limitations as recited in claims 1 and 12 in combination.

Claim 15 is rejected since claim 15 recites an apparatus that contains substantially the same limitations as recited in claim 1.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated

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from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George C. Neurauter, Jr. whose telephone number is (571) 272-3918. The examiner can normally be reached on Monday through Friday from 9AM to 5:30PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (571) 272-3923. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

gcn



JEFFREY PWU
PRIMARY EXAMINER